

## PREVALENSI PARASIT CACING SALURAN PENCERNAAN PADA KUCING LIAR DI KOTA BANYUWANGI

### *Prevalence of Gastrointestinal Helminth Parasite in Stray Cat in Banyuwangi City*

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### Abstrak

Penelitian ini bertujuan untuk mengetahui angka prevalensi kasus infeksi cacing saluran cerna dan mengidentifikasi jenis cacing pada kucing liar di wilayah Kota Banyuwangi. 126 sampel feses kucing yang berasal dari wilayah Kota Banyuwangi dikoleksi dan disimpan dalam larutan *formaldehyde* 10%. Seluruh sampel feses tersebut diperiksa dengan dua metode berbeda yaitu metode natif dan metode pengapungan untuk mengidentifikasi telur cacing yang terdapat pada feses kucing. Pada penelitian ini teridentifikasi tiga genus cacing yang menginfeksi kucing liar di wilayah Kota Banyuwangi yaitu *Toxocara*, *Ancylostoma*, dan *Diphyllobothrium*. Hasil penelitian ini menunjukkan bahwa prevalensi kasus infeksi cacing saluran cerna pada kucing liar wilayah Kota Banyuwangi masih tinggi, yaitu *Toxocara Spp* (43,65%), *Ancylostoma Spp* (3,96%), dan *Diphyllobothrium Spp* (52,38%). Untuk itu diperlukan program pengendalian yang tepat terhadap kasus infeksi cacing saluran cerna pada kucing liar di wilayah Kota Banyuwangi.

Kata kunci: cacing saluran cerna, kucing liar, prevalensi, Kota Banyuwangi

### Abstract

*This research aims to determine the prevalence rate of gastrointestinal helminthes and identify the type of helminthes from stray cats in Banyuwangi City area. 126 cat's fecal samples were collected from all around Banyuwangi City area and stored in 10% formaldehyde solution. All fecal samples were examined by two different method which is native and floatation method to identify the helminth eggs found in cat feces. Three genera of helminth parasites were indentified in this research result from stray cats in Banyuwangi City assigned as *Toxocara*, *Ancylostoma*, and *Diphyllobothrium*. The result of this research indicate that the prevalence of gastrointestinal parasites infections in stary cats in Banyuwangi City is still high, assigned as *Toxocara Spp* (43,65%), *Ancylostoma Spp* (3,96%) and *Diphyllobothrium Spp* (52,38%). Based on that result, proper control program is highly recommended for gastrointestinal helminth parasites case in Banyuwangi City.*

Key words: *gastrointestinal helminth, stray cat, prevalence, Banyuwangi City*

### INTRODUCTION

The prevalence of helminthes as intestinal parasites can vary due to geographical region. Several factors could affect the frequency of a species of parasite in a population. Presence of veterinary care, habits of the local animal populations, season of the year and the cat population composition (Abu-Madi *et al.*, 2008). Internal parasites can decrease endurance by absorbing essential nutrients and interfering with vital organs (Agustina, 2013), the worm

infection can make cats more susceptible to various diseases (Ward, 2009). Gastrointestinal parasites constitute a major source of diseases for cats in the tropics, and have been recognized as important public health problems in several parts of the world (Raji *et al.*, 2013).

Many surveys regarding cat helminthes have been conducted in the world since long time ago. The data of helminthes prevalence in fecal cats reported in Republic of Korea was 82.2%. More than 29 helminthes species including adults or eggs were detected in visceral and fecal samples

of the examined cats. A variety of Cestodes, including *Spirometra erinacei*, *Taenia taeniaeformis* and unidentified species of tapeworm were detected (Sohn and Chai, 2005). In Romania reported that the overall prevalence of endoparasites in household cats was 34.3% (Mircean *et al.*, 2010), the data also reported in Lisbon that found intestinal parasites in 23/74 samples and identified as *Toxocara cati*, *Isospora felis*, *Ancylostoma tubaeforme*, *Dipylidium caninum*, *Uncinaria stenocephala* and *T. Leonine* (Duarte *et al.*, 2010). In Japan was reported, 43.1% cats infected by internal parasites (Yamamoto *et al.*, 2009). Studies of gastrointestinal parasites of cats in several parts of the countries have been limited to the stray cat population (Raji *et al.*, 2013). The data about parasites in cats in part area of Bali which is nearest area from Banyuwangi City have been reported, the prevalence of *T. cati* in cats in Denpasar have been reported 32.5% was household cats and 65% was stray cats, overall prevalence was 48,8% (Nealma *et al.*, 2013).

In Banyuwangi City, there is little information available on the prevalence and distribution of gastrointestinal parasites for cats and no data on the intensity of infection in the cat population. More studies are needed to determine the gastrointestinal parasite in cats population in Banyuwangi City and epidemiological data are needed to develop effective control measures for zoonotic parasites. The objective of this study was to determine the prevalence of helminthes as gastrointestinal parasites from stray cats in Banyuwangi City.

## MATERIALS AND METHODS

A total of 126 fecal samples collected from stray cats in all around Banyuwangi City area divided by north, south, central, west, and east area to represent the condition of Banyuwangi City (Kampung Mandar, Kertosari, Pakis, Singotrunan, and Kepatihan District). Stray cats caught by pet cargo and put in cage until defecation, during the periods cats given feed and ad libitum of water. Fecal samples were put in a tube and preserved in 10% formaldehyde

solution (Marti and Escher, 1990). Concentration method was used to identify the eggs of helminthes by native and flotation techniques and observed under a binocular microscope at 100× magnification. Helminthes eggs were identified based on structural and morphometric features. In addition to qualitative diagnosis, an indirect measure of parasite intensity was obtained by counting eggs, expressed as eggs/gram of faeces. All of the data were analyzed descriptively by using statistic program (Glinz *et al.*, 2010).

## RESULTS AND DISCUSSION

The prevalence of gastrointestinal helminthes in stray cats in Banyuwangi City was presented in Table 1. The result showed that the prevalence of *Toxocara Spp* in Banyuwangi City was relatively high (43,65%), compare to other previous research in Netherland was 2,9% (Overgaauw, 1997), 39.9% in Poland (Luty, 2001) and 43% in Colombia (Echeverry *et al.*, 2012). Zibaei *et al.* (2007) in Iran reported 92.9% of stray cats infected by *Toxocara Spp*. The prevalence of *Toxocara Spp* in cats in Europe have been reported, Epe *et al.* (2004) detected *Toxocara cati* eggs in 3.9% of feline fecal samples in Germany, In Italy, Riggio *et al.* (2013) found *Toxocara cati* in 22% and hookworm eggs in 1.2% of feline fecal samples. In Spain, Gracenea *et al.* (2009) found *Toxocara cati* eggs in 22% of feline fecal samples with distinct higher incidence in kittens. And in Romania *Toxocara cati* were infected 20.3% of household cats (Mircean *et al.*, 2010). This result is in agreement with the research conducted in Denpasar, (Nealma *et al.*, 2013) reported 60% stray cats infected by *Toxocara cati*.

**Table 1.** Prevalence of Gastrointestinal Helminthes in Stray Cats in Banyuwangi City

Genus Identified	Positive Samples	Prevalence (%)
<i>Toxocara Spp.</i>	55/126	43,65
<i>Ancylostoma Spp.</i>	5/126	3,96
<i>Diphyllobothrium Spp.</i>	66/126	52,38

The age of the cat was the most significant risk factor for *Toxocara Spp* in the research

result analysis. The high prevalence of *Toxocara Spp* observed in cats less than six months old (< 6 months) was expected and may be due to the trans-mammary passage of the parasite to the kittens (Labarthe *et al.*, 2004). This could play a significant role in contributing to the incidence of cutaneous larva migrans in the human population. *Toxocara cati* is an ascarid nematode which was the next most common intestinal parasite observed in this study with a relatively high prevalence of 43,65%. The high prevalence of *Toxocara cati* infection recorded poses a high risk to humans in view of the large number of eggs about 200.000 eggs produced per day by a female of this parasite that are deposited in the soil along with cat's faeces. These eggs can survive for a long time in the environment can be accidentally ingested by humans in which they can cause visceral larva migrans or human toxocariasis due to larva migration, a commonly reported zoonotic helminthiasis (Holland and Smith, 2006).

The prevalence of *Ancylostma Spp* which worldwide known as hookworm in stray cats in Banyuwangi City was 3,96%. It was lower than in Brazil that was 94,2% identified three species; *A. caninum* (67.3%), *A. braziliense* (21.1%) and *A. tubaeforme* (9.6%) (Coelho *et al.*, 2011) and the recent study reported 60.69% cats in Brazil were infected by *Ancylostma Spp* (Ramos *et al.*, 2013). The prevalence in Korea was 33% in feral cats (Sohn and Chai, 2005), in Romania was 10.1% in household cats (Mircean *et al.*, 2010) and in Colombia which was 7.4% in house cats (Echeverry *et al.*, 2012), low prevalence of hookworm also reported in Spain (Gracenea *et al.*, 2009) found *A.tubaeforme* eggs in 4% of feline fecal samples. Hookworm larvae that normally mature in the intestinal tracts of animals can cause cutaneous larva migrans in people. Zoonotic hookworms known to cause this condition include *A.braziliense*, *A. caninum*, *A. ceylanicum*, *A.tubaeforme*, *Uncinaria stenocephala* and *Bunostomum phlebotomum*. Other species of hookworms found in animals, including wildlife and captive exotics, might also be able to cause cutaneous larva migrants (Acha and Szyfres, 2003).

Cats are the definitive host of some Cestodes or well known as tapeworm. Cestodes that have been reporting infected cats were *Diphyllobothrium Spp*, *Joyeuxiella Spp*, *Spirometra Spp*, *Dipylidium caninum*, *Taenia taeniaeformis* and *Echinococcus Spp*. The prevalence of *Diphyllobothrium Spp* found from stray cats in this research was the highest (52,38%). Other research reported that in Iranian stray cats detected *Cestodes* were *Joyeuxiella pasqualei* (34.3%), *Dipylidium caninum* (49.5%), *Taenia taeniaeformis* (12.3%) and *Spirometra Spp* (3.8%) (Zibaei *et al.*,2007). The prevalence of cat *Cestodes* in Japan reported *Spirometra erinaceieuropaei* (8.3%), *Dipylidium caninum* (1.4%), *Taeniidae* (0.2%) and *Diphyllobothrium nihonkaiense* (0.1%) (Yamamoto *et al.*, 2009). *Diphyllobothrium latum* is a tapeworm that has a serious attention of public health because it is a zoonotic agent. Some previous studies reported that thus tapeworms were infecting humans (Revenga, 1993).

The freshwater fishes, such as pikes, burbot, trouts, salmon, and perch were listed as the second intermediate hosts for *Diphyllobothrium Spp*. However, the species of the broad fish tapeworm such as *Diphyllobothrium latum*, transmitted by salmonid fish was put to question, and the one in Japan by was assigned as a new species *Diphyllobothrium nihonkaiense* (Yamamoto *et al.*, 2009), and another in Siberia transmitted by 2 salmonid fish species, was assigned as *Diphyllobothrium klebanovskii* (Nicoulaud *et al.*, 2005). Banyuwangi District is an area which is surrounded by sea. Therefore, stray cats-infecting *Diphyllobothrium Spp* in Banyuwangi City may be caused by consuming saltwater fishes. It is very possible because saltwater fishes are the biggest marine commodity in Banyuwangi City and also many traditional markets sell saltwater fishes in this area. The saltwater fishes also become a potential intermediate host for *Diphyllobothrium Spp* in Banyuwangi City and it is important to conduct more deeper research study because based on

this research result, prevalence of *Diphyllobothrium Spp* was the highest (52,38%).

The high overall prevalence of gastrointestinal parasites of cats obtained in this study is considered to be critical from the viewpoint of public health importance. Some of these parasite species are responsible for several zoonotic diseases such as visceral larva migrans and ocular larva migrans caused by infection with *Toxocara cati* in humans. Therefore, there is the need to put in place appropriate control strategies by the public health authorities in these communities such as increasing the awareness of feline zoonotic parasites in the population which could be helpful to prevent or minimize zoonotic transmission. In addition, establishing a control programs to diagnose, treat and control gastrointestinal parasites of companion animals including cats in these area is highly recommended.

### CONCLUSION

It can be concluded that the prevalence of gastrointestinal helminth parasites in stray cats in Banyuwangi City was high. The helminth parasites that found in this research were *Toxocara Spp* (43,65%), *Ancylostoma Spp* (3,96%) and *Diphyllobothrium Spp* (52,38%).

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### REFERENCES

- Abu-Madi, M.A., D.A. Al-Ahbabi, M.M. Al-Mashadani, R. Al-Ibrahim, P. Pal, J.W. Lewis. 2008. Patterns of parasitic infections in faecal samples from stray cat populations in Qatar. *J. Helminth* 81: 281-286.
- Acha, P.N., B. Szyfres. 2003. Zoonoses and communicable diseases common to man and Animals: Cutaneous larva migrans; Parasitoses. *Sci Tech Pub* 580: 249-52.
- Agustina, K.K. 2013. Identification and prevalence of *strongyle* type worm in pigs in Bali Indonesia. *Bul Vet Udayana* 5(2): 131-138.
- Coelho, W.M.D., A.F.T. Amarante, J.C. Apolinario, N.M.D. Coelho, K.D.S. Bresciani. 2011. Occurrence of *Ancylostoma* in dogs, cats and public places from Andradina city, Sao Paulo State, Brazil. *Rev Inst Med Trop Sao Paulo* 53(4): 181-184.
- Duarte, A., I. Castro, I.M. Pereira da Fonseca, V. Almeida, L.M. Madeira de Carvalho, J. Meireles, M.I. Fazendeiro, L. Tavares, Y. Vaz. 2010. Survey of infectious and parasitic diseases in stray cats at the Lisbon Metropolitan Area, Portugal. *J Feline Med Surg* 12(6): 441-446.
- Echeverry, D.M., M.I. Giraldo, J.C. Castaño. 2012. Prevalence of intestinal helminths in cats in Quindío, Colombia. *J Biomedica* 32(3): 430-436.
- Epe, C., N. Coati, T. Schnieder. 2004. Results of parasitological examinations of faecal samples from horses, ruminants, pigs, dogs, cats, hedgehogs and rabbits between 1998 and 2002. *Dutsch Tierärztl Wochenschr* 111: 243-247.
- Glinz, D., D. Kigbafori, K.D. Silué, S. Knopp, L.K. Lohourignon, K.P. Yao, P. Steinmann, L. Rinaldi, G. Cringoli, E.K. N'Goran, J. Utzinger. 2010. Comparing Diagnostic Accuracy of Kato-Katz, Koga Agar Plate, Ether-Concentration, and FLOTAC for *Schistosoma mansoni* and Soil-Transmitted Helminths. *Plos Neglected Trop Dis* 4(7): 1-10.
- Gracenea, M., M.S. Gomez, J. Torres. 2009. Prevalence of intestinal parasites in shelter dogs and cats in the metropolitan area of Barcelona (Spain). *Acta Parasitol* 54: 73-77.

- Holland, C.V., H.V. Smith. 2006. *Toxocara* the enigmatic parasite. Wallingford UK, *CABI Publishing* 301.
- Labarthe, N., M.L. Serrao, A.M.R. Ferreira, N.K.O. Almeida, J. Guerrero. 2004. A survey of gastrointestinal helminths in cats of the metropolitan region of Rio de Janeiro, Brazil. *Vet. Parasitol* 123: 133-139.
- Luty, L. 2001. Prevalence of Species of *Toxocara* in dogs, cats and red foxes from the Poznan region, Poland. *J. Helminthol* 75: 153-156.
- Marti, H.P., E. Escher. 1990. SAF: an alternative fixing solution for parasitological stool test. *Schweiz Med Wochenschr* 120:1473-1476.
- Mircean, V., A. Titilincu, C. Vasile. 2010. Prevalence of endoparasites in household cat (*Felis catus*) populations from Transylvania (Romania) and association with risk factors. *Vet Parasitol* 171(1-2): 163-166.
- Nealma, S., I.M. Dwinata, I.B.M. Oka. 2013. The Prevalence of *Toxocara cati* in local cat in Denpasar. *Indonesia Medicus Veterinus* 2(4): 428-436.
- Nicoulaud, J., H. Yéra, J. Dupouy-Camet. 2005. Prevalence of *Diphyllbothrium latum*, L., 1758 infestation in *Perca fluviatilis* from Lake Lemán. *Parasite* 12(4): 362-364.
- Overgaauw, P.A.M. 1997. Aspect of *Toxocara* epidemiology: *Toxocarasis* in dogs and cats. *Critical Rev Microbiol* 23: 233-251.
- Raji, A.A., A.A. Magaji, M.B. Bello, M.D. Lawal, A. Mamuda, M.S. Yahaya. 2013. Prevalence of gastrointestinal parasites of stray cats: a case study of two hospitals in Sokoto Metropolis, Sokoto, Nigeria. *J. Bacteriol Parasitol* 4(4): 1-3.
- Revenga, J.E. 1993. *Diphyllbothrium dendriticum* and *Diphyllbothrium latum* in fishes from southern Argentina: association, abundance, distribution, pathological effects, and risk of human infection. *J. Parasitol* 79(3): 379-383.
- Riggio, F., R. Mannella, G. Ariti, S. Perrucci. 2013. Intestinal and lung parasites in owned dogs and cats from central Italy. *Vet. Parasitol* 193(1-3): 78-84.
- Sohn, W.M., J.Y. Chai. 2005. Infection status with helminthes in feral cats purchased from a market in Busan, Republic of Korea. *Korean J. Parasitol* 43(3): 93-100.
- Ward, E. 2009. Roundworm Infection in Cats. *Kingsbrook Animal Hospital* 1-3.
- Yamamoto, N., M. Kon, T. Saito, N. Maeno, M. Koyama, K. Sunaoshi, M. Yamaguchi, Y. Morishima, M. Kawanaka. 2009. Prevalence of intestinal canine and feline parasites in Saitama Prefecture, Japan. *Kansenshogaku Zasshi* 83(3): 223-228.
- Zibaei, M., S.M. Sadjjadi, B. Sarkari. 2007. Prevalence of *Toxocara cati* and other intestinal helminths in stray cats in Shiraz, Iran. *J. Trop Biomed* 24(2): 39-43.

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